

3.5.30

Find  $dp/dq$  for  $p = \frac{\tan q}{1 + \tan q}$ .Solution

By the Derivative Quotient Rule (Theorem 3.3.H) we have

$$\frac{dp}{dq} = \frac{[\sec^2 q](1 + \tan q) - (\tan q)[0 + \sec^2 q]}{(1 + \tan q)^2}$$

$$= \frac{\sec^2 q + \sec^2 q \tan q - \tan q \sec^2 q}{(1 + \tan q)^2}$$

$$= \frac{\sec^2 q}{(1 + \tan q)^2} \quad \square$$